

ABSTRACT OF THE DISCLOSURE

Under a condition that a main stream hydrogen amount fed into a fuel cell is constant, an off-gas circulation amount and a hydrogen concentration of the circulated off-gas are in a predetermined relationship. Considering this relationship, the hydrogen concentration of the circulated off-gas can be obtained by detecting the main stream hydrogen amount and the off-gas circulation amount. The impurities contained in the circulated off-gas are chiefly nitrogen. The nitrogen concentration of the circulated off-gas is inverse proportional to the hydrogen concentration. The nitrogen concentration (i.e., impurity concentration) is obtainable by detecting the hydrogen concentration. Increase of impurities contained in the circulated off-gas is detectable in advance based on the main stream hydrogen amount and the off-gas circulation amount. The impurities can be removed before the output of the fuel cell becomes unstable. The fuel cell operates stably.